

What is claimed is:

1        1. A positioning apparatus for a towing vehicle having an attachment point  
2 comprising:

3              a towing vehicle having an attachment point for attaching a towed item;

4              a 5th wheel encoder secured to the attachment point, the 5th wheel  
5 encoder adapted to be in contact with the towed item;

6              a sensor on the 5th wheel encoder for determining an angular position of  
7 the towed vehicle relative to the towed item; and

8              a device for receiving the relative angular position and transmitting  
9 information on the relative angular position.

1        2. The positioning apparatus of claim 1, wherein the towing vehicle  
2 comprises a rearview mirror and further comprising a device for actuating the  
3 position of the rearview mirror based on the information on the relative angular  
4 position.

1        3. The positioning apparatus of claim 2, wherein the position of the  
2 mirror is actuated by a geared stepper motor.

1        4. The positioning apparatus of claim 3, wherein the receiving  
2 device is a microprocessor for correlating the position of the rearview mirror to  
3 the relative angular position.

1        5. The positioning apparatus of claim 1, further comprising a device  
2 for notification of the relative angular position.

1        6. The positioning apparatus of claim 1, wherein the 5th wheel  
2 encoder comprises a rotating device, the rotating device being adapted to sense  
3 the relative angular position and to rotate in a direction and an amount  
4 correlated to the relative angular position.

1        7. The positioning apparatus of claim 6, wherein the rotating device  
2 is an actuating wheel mechanically coupled to an optical encoder, the optical  
3 encoder being adapted to detect and transmit to the receiving device the  
4 direction and amount of rotation of the actuating wheel.

1           8. The positioning apparatus of claim 7, further comprising a  
2 microprocessor to receive the direction and amount of rotation, determine the  
3 relative angular position, and transmit at least one of a signal to actuate a  
4 rearview mirror of the towing vehicle and a signal to provide notification of the  
5 relative angular position, wherein the microprocessor comprises software for  
6 controlling the receipt, determination, and transmission.

1           9. The positioning apparatus of claim 8, wherein the notification  
2 provided is a visible or audible warning to a driver of the towing vehicle.

1           10. The positioning apparatus of claim 8, wherein the software is  
2 programmable.

1           11. The positioning apparatus of claim 10, wherein the software  
2 comprises a mathematical equation for correlating the direction and the amount  
3 of rotation of the actuating wheel to the relative angular position.

1           12. The positioning apparatus of claim 11 wherein the mathematical  
2 equation maintains a constant proportionality ratio between the relative angular  
3 position and the positioning of a rearview mirror.

1           13. The positioning apparatus of claim 8 wherein the software uses  
2 routines or look up tables to correlate the relative angular position with the  
3 actuation of the rearview mirror.

1           14. The positioning apparatus of claim 6, wherein the 5th wheel  
2 encoder comprises at least one of a conventional spring mechanism, an air  
3 spring utilizing compressed air, and a solenoid utilizing electrical current for  
4 maintaining a constant force between the rotating device and the towed item.

1           15. The positioning apparatus of claim 1, further comprising a  
2 display for showing the relative angular position.

1           16. The positioning apparatus of claim 1, wherein the attachment  
2 point is selected from the group consisting of a fifth wheel plate, a ball and  
3 hitch mechanism, and a pintle hitch.

1           17. The positioning apparatus of claim 1, wherein the 5th wheel  
2 encoder is secured to the attachment point by a mounting flange.

1           18. The positioning apparatus of claim 17, wherein the mounting  
2 flange is substantially planar or L-shaped.

1           19. The positioning apparatus of claim 1, further comprising a towed  
2 item attached to the towing vehicle at the attachment point, wherein the 5th  
3 wheel encoder comprises a rotating device in contact with the towed item.

1           20. The positioning apparatus of claim 19, wherein the rotating  
2 device is coupled to an optical encoder, the optical encoder being adapted to  
3 detect and transmit to the receiving device the direction and amount of rotation  
4 of the rotating device.

1           21. A positioning apparatus for a towing vehicle having a fifth wheel  
2 plate attachment point comprising:

3           a towing vehicle having a fifth wheel plate;

4           a towed item attached to the towing vehicle at the fifth wheel plate;

5           a 5th wheel encoder secured to the attachment point, the 5th wheel  
6 encoder comprising an actuating wheel being in contact with the towed item for  
7 determining an angular position of the towed vehicle relative to the towed item,  
8 the actuating wheel mechanically coupled to an optical encoder; and

9           a microprocessor device for receiving the relative angular position from  
10 the optical encoder and transmitting information on the relative angular  
11 position to a rearview mirror actuating device for controlling the position of a  
12 rearview mirror and to a notification device for providing notification of the  
13 relative angular positioning.

1           22. A computer-readable medium with executable instructions for  
2 performing the steps of:

3           receiving a signal from a sensor, the signal comprising positional  
4 variables selected from the group consisting of the relative angular position of a  
5 towing vehicle and a towed item, a position of a rearview mirror, a distance  
6 from the rearview mirror and an attachment point, and a distance from the  
7 attachment point to an axle of a trailer; and

8           correlating the positional variables using at least one of routines and  
9   lookup tables.

1           23.   The computer-readable medium of claim 22, further comprising  
2   performing the step of displaying the relative angular position in degrees or  
3   radians.